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ABSTRACT

An ion implantation method for reducing energy contamination in low energy beams is disclosed in this invention. The ion implantation method requires the use of a target chamber for containing a target for implantation in vacuum and an ion source chamber with an ion source for generating an ion beam. A means for conducting a mass analysis of the ion beam, such as an analyzer magnet, is also needed. The ion source chamber includes a beam deceleration optics that includes a beam deceleration means for decelerating the ion beam for producing a low energy ion beam. The beam deceleration optics further includes a beam steering means for generating an electrostatic field for steering the ion beam to a targeted ion-beam direction and separating neutralized particles from the ion beam by allowing the neutralized particles to transmit in a neutralized-particle direction slightly different from the targeted ion-beam direction. The ion beam steering means further includes a beam stopper for blocking said neutralized particles from reaching said target of implantation that minimizes energy contamination from high energy neutralized particles.

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